WHAT IS CLAIMED IS:

1. A method of inspecting a surface associated with manufacture of an integrated circuit, the method comprising the steps of:

providing an electron beam to the surface;

transforming at least a portion of the surface; and

inspecting the surface using a scanning electron microscope (SEM), wherein the transforming step occurs before the inspecting step.

2. The method of claim 1, wherein the surface includes at least one patterned feature having a top portion, side portions, and a bottom portion, and the transforming step includes chemically changing the top portion and the side portions to form a shell that encapsulates the bottom portion.

3. The method of claim 2, wherein the shell has a depth in the range of approximately 30 to 200 Å.

4. The method of claim 2, wherein the surface is an organic-based photoresist layer.

5. The method of claim 4, wherein the transforming step includes decomposing polymer functional groups included in the top and the side portions.

6. The method of claim 1, wherein the inspecting step includes at least one of preventing volatile species from leaving the surface and substantially dissipating a charge built up in the surface.

7. A patterned photoresist layer configured to facilitate accurate critical dimension measurements of features thereon using a scanning electron microscope (SEM), the layer comprising:

a treated region; and

an untreated region, wherein the treated region comprises a top surface and side surfaces surrounding the untreated region, and the treated region having at least one of a different electrical and material property relative to the untreated region.

8. The layer of claim 7, wherein the material comprising the patterned photoresist layer is an organic-based polymer.

9. The layer of claim 7, wherein the treated region is formed by flood exposing the patterned photoresist layer to an electron beam.

10. The layer of claim 9, wherein the electron beam has a beam current of approximately 3 mA, a dose in the range of approximately 500-4000 $\mu C/cm^2$, and an accelerating voltage up to approximately 10 keV.

11. The layer of claim 9, wherein the electron beam has a dose of approximately 2000 $\mu C/cm^2$ and an accelerating voltage in the range of approximately 3-5 keV.

12. The layer of claim 9, wherein the electron beam cross-links and decomposes polymer functional groups included in the material comprising the treated region.

13. The layer of claim 7, wherein the treated region has a thickness of approximately 30 to 200 Å.

14. The layer of claim 7, wherein the treated region is configured to prevent outgassing species generated by the untreated region from coming into contact with the SEM.

15. The layer of claim 7, wherein the treated region is configured to dissipate a charge generated in the patterned photoresist layer in association with the use of the SEM.

16. A process for reducing the build up of at least one of charge, heat, and volatile species in a photoresist layer during scanning electron microscope (SEM) inspection, the process comprising:

exposing the photoresist layer to a flood electron beam, the photoresist layer including at least one patterned feature having a top surface, side surfaces, and an untreated portion; and

forming a shell in the photoresist layer in response to the flood electron beam, wherein the shell is comprised of the top surface and the side surfaces, and the shell reduces the build up of at least one of charge, heat, and volatile species associated with the at least one feature during SEM inspection.

17. The process of claim 16, wherein the exposing step includes exposing the flood electron beam having operating conditions of approximately 3 mA, 500-4000 $\mu C/cm^2$, and up to 10 keV.

18. The process of claim 16, wherein the shell surrounds the untreated portion and a thickness of the shell is approximately 30-200 Å.

19. The process of claim 16, wherein the forming step includes cross-linking the top surface and the side surfaces to form the shell.

20. The process of claim 16, wherein the forming step includes decomposing the functional groups included in the top surface and the side surfaces to form the shell.